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NEW GENERA AND SPECIES OF SNAKES

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DURING the course of my studies principally of Brazilian snakes I have found two new genera and fourteen new species. I am describing them in anticipation of a more extended discussion of these forms in connection with monographs now in preparation.

I wish very heartily to thank Dr. Leonhard Stejneger for the opportunity to study the American pit vipers in the United States National Museum and the staff of the Museum of Comparative Zoölogy for hospitality during the past year.

***Drymobius rubriceps* sp. nov.**

Diameter of the eye equal to four fifths of its distance from the end of the snout; rostral broader than deep (3.5: 2.5), visible from above; internasals

and praefrontals a little broader than long; internasal suture more than a half of the praefrontal suture (2.5:4); frontal more than once and a half as long as broad (5.5:3.3), once and a half as long as its distance from the end of the snout (5.5:3.5), as long as the supraoculars and a little shorter than the parietals (5.5:6.5); parietal suture once and a half as long as the fronto-rostral distance (5.5:3.5); nasal divided; loreal a little longer than deep; one praecocular not reaching the frontal; 2 postoculars; temporals, 2 + 2; 7 upper labials, 4th and 5th entering the orbit; 10 lower labials, 5/4 in contact with the anterior chin shields, 1st very narrow, almost four times as long as broad (2.5:0.75), 5th much larger and in contact with the posterior chin shield, which is longer than the anterior (6.5:5). Scales smooth, with double apical pits, in 17 rows; ventrals, 191; anal entire; subcaudals, 117 pairs.

Back reddish white anteriorly, gradually changing to bluish gray posteriorly, with a series of dark gray to olive gray bands extending down to the sides of the ventrals; upper surface of the tail entirely bluish gray; head brick-red; parietals with a black longitudinal streak; frontal, supraoculars and posterior part of the praefrontals spotted with black; internasals and praefrontals brownish red; sides of the head yellowish, sometimes slightly dotted with black, its lower surface as well as the belly entirely yellowish.

Total length, 480 mm.; tail, 140 mm.

Type, an immature ♀, no. 1844 in the collection of the Instituto de Butantan, sent alive from Pennapolis, in the northwestern part of the State of São Paulo, Brazil, by Mr. Nagib Bassil, on December 30, 1919.

Drymobius rubriceps, which is a very aggressive species, is nearly related to *D. boddaerti* (Sentzen) and *D. brazili* Gomes¹ by its head shields and scales on the body. It can be distinguished from them by its wonderful color and by the following characteristics which I was able to recognize by examining all the specimens of *D. brazili* existing in the collection of Butantan and a good lot of specimens of *D. boddaerti*, which came from the Brazilian States of Amazonas, Pará and Matto Grosso.

¹ J. Florencio Gomes, *Memorias do Instituto de Butantan*, 1918, I, 1, pp. 81-83.

NOTE: One line of the description of *D. brazili*, existing in Dr. Gomes's manuscript, was omitted on p. 81 of the above paper, so we must read: "sutura internasal cerca de metade da sutura entre as prefrontaes, frontal cerca de uma vez e meia . . ." in place of: "sutura internasal cerca de uma vez meia. . ."

	<i>D. rubriceps</i>	<i>D. brazili</i>	<i>D. boddaerti</i>
Upper labials	7	8	9 (rarely 8, 10 or 11)
1st lower labial	Very narrow; more than three times as long as broad.	Relatively broad; about twice as long as broad.	Relatively broad; about twice as long as broad.
5th lower labial	Larger than the 6th.	Larger than the 6th.	Smaller than the 6th.
Ratio of frontal length to fronto-rostral distance	$\frac{5.5}{3.5} = \frac{3}{2} +$	$\frac{8.8}{8} = \frac{1}{1} +$	$\frac{7.5}{7} = \frac{1}{1} +$
Ratio of parietal suture to fronto-rostral distance	$\frac{5.5}{3.5} = \frac{3}{2} +$	$\frac{8}{8} = \frac{1}{1}$	$\frac{7.5}{7.5} = \frac{1}{1}$
Ratio of anterior chin shields to posterior chin shields	$\frac{5}{6.5} = \frac{2}{3} +$	$\frac{7.6}{12} = \frac{2}{3} -$	$\frac{5}{9} = \frac{2}{3} -$

Rhadinaea brazili sp. nov.

Head slightly distinct from the neck; eye moderate, with round pupil; 17 maxillary teeth, forming an uninterrupted series.

Rostral much broader than deep, visible from above; internasals as broad as long, a little shorter than the praefrontals; frontal slightly longer than broad, slightly shorter than its distance from the end of the snout, shorter than the parietals; loreal as long as deep; one large praeocular reaching the upper surface of the head; 2 postoculars; temporals, 1 + 2; 8 upper labials, 4th and 5th entering the orbit; 4 or 5 lower labials in contact with the anterior chin shields, which are as long as the posterior. Scales smooth, without apical pits, in 17 rows; ventrals, 191; anal divided; subcaudals, 45-61.

Blackish above, with narrow whitish cross-bands anteriorly, entirely black posteriorly; head brownish black; lips brown, spotted with darker; belly brownish yellow with transverse black spots.

Represented in the collection of the Instituto de Butantan by three specimens:—

Type, no. 930, adult ♂, sent alive from the locality Julio Pontes, State of São Paulo, Brazil, by Mr. Manoel Mariano da Silva Jota, in October, 1912; subcaudals, 30/30 + 1; total length, 685 mm. + n; tail, 70 mm. + n.

No. 346, adult ♂, sent alive from the locality Guayuvira, State of São Paulo, Brazil, by Mr. Antonio Azevedo da Silva Junior, in January, 1914; subcaudals, 45/45; total length, 560 mm.; tail, 75 mm.

No. 3006, young, without any data; subcaudals, 61/61; total length, 355 mm.; tail, 57 mm.

Rhadinaea brazili, which is named in honor of Dr. Vital Brazil, former director of the Instituto de Butantan, is closely allied to *Rhadinaea cobella* (L.), from which it differs in the number of maxillary teeth, in color and markings, shape and size of the frontal shield, and much higher number of ventrals.

During a careful study which I have been making of the specimens of Brazilian snakes, existing either in Brazil in the collections of the Museu Paráense, Museu Rocha of Ceará, Medical School of Bahia, Medical School of Rio, Instituto Oswaldo Cruz, Museu Nacional, Museu Paulista and Instituto de Butantan, or in those of the Museum of Comparative Zoölogy and others in this country, where I am now continuing my work, I have been able not only to corroborate Miss J. B. Proctor's¹ recent description of the new genus *Sordellina*, but to add a new species to it.

Sordellina pauloensis sp. nov.

Head scarcely distinct from neck; eye small, with round pupil; body cylindrical; end of tail conical, sharply pointed. Rostral about twice as broad as deep, slightly visible from above; nasal semi-divided; internasals triangular, shorter than the praefrontals; praefrontals about twice as broad as long; frontal a little longer than broad, twice as broad as the supraocular, a little longer than its distance from the end of the snout, much shorter than the parietals; loreal as long as deep; a large praecocular reaching the upper surface of the head but separated from the frontal; 2 postoculars, the upper large, deeper than long; temporals, 1 + 2, the anterior about twice as long as deep; 8 upper labials, 4th and 5th entering

¹ J. B. Proctor, On a new Genus and Species of Colubrine Snake from southeastern Brazil, Ann. Mag. Nat. Hist., (9), XI, 1923, p. 228.

the orbit; 4 lower labials in contact with the anterior chin shields, which are shorter than, or sometimes as long as, the posterior. Scales smooth, without apical pits, in 17 rows; ventrals, 139–158; anal divided, subcaudals, 47–58 pairs.

Dark olive or dark brown above; edges of the scales lighter; a yellowish narrow streak running on the labials, broadening into a blotch on each side of the neck, and then continuing as a narrow line a little distance on the contiguous borders of the 1st and 2d rows of scales; chin and throat spotted with yellowish; belly dark olive or brown with two yellowish, almost uninterrupted lines running laterally and separated one from the other by an olive or brown median line, the middle of which is occupied posteriorly by an interrupted yellowish line formed by small spots axially placed on the free edge of the ventrals; under surface of the tail of the same color, with two yellowish longitudinal lines separated one from the other by a dark median line.

Type, adult ♂, no. 3007 in the collection of the Instituto de Butantan; sent alive from the locality Poá, near the capital of the State of São Paulo, Brazil, by Mr. Marcos Favali, on July 13, 1922; total length, 387 mm.; tail, 80 mm.; ventrals, 139; subcaudals, 51 pairs.

Paratypes: Adult ♂, no. 1578 in the collection of the Museu Paulista (of the ophiological section of which I am also in charge), caught in the locality Rio Grande, near the Serra de Cubatão, State of São Paulo, Brazil, by Mr. Mathias Wacket, in March, 1902; total length, 300 mm.; tail, 56 mm.; ventrals, 144; subcaudals, 47 pairs. Young ♀, no. 1579 in the collection of the Museu Paulista, caught in the locality Conceição de Itanhaem on the coast of the State of São Paulo, by Mr. Francisco Adam, in August, 1909; total length, 184 mm.; tail, 36 mm.; ventrals, 158; subcaudals, 58 pairs.

Sordellina pauloensis is closely allied to *S. brandon-jonesii* Proctor, 1923, from which it differs in the physiognomy and in the ventral and subcaudal markings, and in having a larger preocular, a deeper upper postocular, and the 4th and 5th upper labials in contact with the eye.

Since 1900, when Schenkel¹ described the genus *Paroxyrhopus* with the single species *reticulatus*, based on one specimen collected in Belmacue, Paraguay, by Dr. C. Ternetz, so far as I know no other specimen has been found, which implies the rarity

¹ E. Schenkel, Achter Nachtrag z. Kat. d. herp. Sammlung des Basler Museums, 1900, pp. 168–170.

of the new genus and new species. Nevertheless, during the work of classification I have done on the Brazilian collections, I have been very lucky indeed to find two small snakes which proved to have the same pholidosis and the same craniological and osteological characteristics as the genus *Paroxyrhopus* and to be, moreover, closely allied to the species *P. reticulatus*.

Paroxyrhopus atropurpureus sp. nov.

Body cylindrical; head short, somewhat distinct from the neck; eye small, a little turned upwards. Rostral broader than deep, visible from above; internasals subtriangular, shorter than the praefrontals which are as long as broad; frontal short, subtriangular, as long as broad, shorter than its distance from the tip of the snout, much shorter than the parietals; nasal entire; loreal once and a half to twice as long as deep; praecocular large, extending to the upper surface of the head and in contact with the frontal; supraocular small and straight; 2 postoculars, the upper larger; 8 (in one instance 7) upper labials, 3d, 4th and 5th, 3d and 4th, or 4th and 5th, entering the orbit, 6th (once 5th) in contact with the parietal between the postoculars and the anterior temporal; temporals, 1 + 2; 3 or 4 lower labials in contact with the anterior chin shields, which are as large as the posterior and are separated from the symphysial by the first pair of lower labials. Scales smooth, without apical pits, in 19 rows; ventrals, 173–181 + 1/2, rounded laterally; anal entire; subcaudals, 39–40 pairs.

Blackish brown above, irregularly variegated with dark red on the sides; tips and belly entirely yellowish.

Type, adult ♂, no. 3003 in the collection of the Instituto de Butantan, received alive on March 18, 1920, from Mr. Paulo Treszoks, locality Nova Baden, in the southern part of the State of Minas Geraes, Brazil. Upper labials, 8/8 (3d, 4th and 5th entering the orbit); ventrals, 181 + 1/2; subcaudals, 40 pairs. Total length, 430 mm.; tail, 60 mm.

Paratype: Adult ♂, no. 1499 in the collection of the Museu Paulista, caught near Marianna, in the southeastern part of the State of Minas Geraes, by Mr. Jacyntho B. de Godoy, in 1898. Upper labials, 7/8 (3d and 4th/4th and 5th entering the orbit); ventrals, 173; subcaudals, 39 pairs. Total length, 400 mm.; tail, 57 mm.

I found two more specimens of *P. atropurpureus* in the collection of the Museu Nacional, of Rio Brazil. They were collected in the State of Minas Geraes, Brazil, and are numbered 345, 346.

Paroxyrhopus atropurpureus can be distinguished from *P. reticulatus* by its physiognomy and general color, and by having an entire nasal, 2 postoculars, and supraocular not turned downwards behind the orbit.

PLATYINION gen. nov.

Head not distinct from the neck which is broad; eye moderate, with round pupil; nasal divided. Maxillary teeth 5, subequal, followed, after an interspace twice as broad as the others, by one large grooved fang situated just below the vertical of the posterior border of the orbit; anterior mandibular teeth longest. Body cylindrical; scales smooth, with single apical pits, in 17 rows; ventrals rounded. Tail moderate; subcaudals in two rows.

This genus is allied to *Conophis* Peters, 1860, from which it differs in the number and disposition of the teeth, the shape of the neck, and in the presence of pits on the scales.

Platyinion lividum sp. nov.

Rostral as deep as broad, just visible from above; internasals triangular, as long as broad, shorter than the praefrontals; praefrontals a little broader than long; frontal narrow, more than twice as long as broad, a little longer than its distance from the end of the snout, almost as long as the parietals; nasal divided; loreal longer than deep; 2 praecoculars, lower very small, upper large, reaching the upper surface of the head, but separated from the frontal; 2 postoculars; temporals, 1 + 2; 7 upper labials, 3d and 4th entering the orbit; 4 lower labials in contact with the anterior chin shields, which are a little shorter than the posterior. Scales smooth, with single apical pits, in 17 rows. Ventrals, 162 + 2/2, rounded laterally; anal divided; subcaudals, 71 pairs.

Bluish gray above, the scales usually edged with black; uniformly yellowish beneath.

Total length, 730 mm.; tail, 165 mm.

Type, adult ♂, no. 3000 in the collection of the Instituto de Butantan, received alive in November, 1920, from Dorizon, State of Paraná, Brazil.

*Sibynomorphus*¹ *barbouri* sp. nov.

Body slender, compressed laterally; head distinct from neck; pterygoid teeth present; eye large, with vertical pupil. Rostral twice as broad as deep, scarcely visible from above; internasals half as long as the prefrontals; frontal hexagonal, a little longer than broad, as long as its distance from the end of the snout, much shorter than the parietals; nasal semi-divided; loreal large, as long as deep; no praecocular; 2 postoculars; temporals, $2 + 2/2 + 3$; 8/9 upper labials, 3d, 4th and 5th entering the orbit; 1st lower labial in contact with its fellow behind the symphysial; 4 pairs of chin shields, anterior a little longer than broad. Scales in 15 rows, vertebral moderately enlarged; ventrals, 196; anal entire; subcaudals, 118 pairs.

Cream-colored above, with a dorsal series of large transverse dark brown spots extending down to the sides of the ventrals, sometimes interrupted on the vertebral line and so alternating with those of the opposite side; head brownish yellow with small dark dots on the parietals; yellowish beneath, laterally lineolated with brown.

Total length, 600 mm.; tail, 185 mm.

Type, adult, no. 306 in the collection of the Instituto de Butantan, sent from Utinga, State of Alagoas, Brazil, by Mr. J. E. Coutinho, in October, 1913.

This species is named in honor of my friend Dr. Thomas Barbour, to whom I am indebted for much advice and many facilities during the studies I have been undertaking at the Museum of Comparative Zoölogy of Harvard University.

¹ This generic name is to be used in preference to *Leptognathus*, *Cochliophagus*, *Stremmatognathus* and *Anholodon*, in obedience to the international rules of zoölogical nomenclature. In effect, *Leptognathus* Dum. et Bibr., 1853 (Mémoires Acad. Scient., XXIII, p. 467), was preoccupied by Swainson (1839) for a genus of fishes and by Westwood (1841) for a genus of insects, as C. Berg (Comunic. del Mus. Nac. Buenos Aires, no. 8, 1901, p. 291) and J. F. Gomes (Rev. do Museu Paulista, t. X, 1918, p. 526) have already pointed out; and all of them, *Cochliophagus* Dum. et Bibr., 1854 (type, *inaequifasciatus*), *Stremmatognathus* Dum. et Bibr., 1854 (type, *catesbyi*) and *Anholodon* Dum. et Bibr., 1854 (type, *mikaniü*), as well as *Leptognathus*, have been proposed as generic names, respectively, eleven and ten years after Fitzinger (Systema Reptilium, I, 1843, p. 27) originated the monotypical genus *Sibynomorphus* with the type species *mikaniü*.

I take this opportunity to thank Dr. E. R. Dunn for much information which he kindly sent me about this question.

Sibynomorphus barbouri is related to *S. articulatus* (Cope), *S. incertus* (Jan.), *S. gracilis* (Boulenger),¹ and *S. bolivianus* (Werner).² It differs from *S. articulatus* in the color and markings of the head and in the number of the ventrals and the subcaudals; from *S. incertus* in having no loreal, a semi-divided nasal, and four pairs of chin shields; from *S. gracilis* in the color and in the number of chin shields; and from *S. bolivianus* in the color, the length of the internasals, the number of temporals and chin shields, and in having no loreal.

Sibynomorphus garbei sp. nov.

Body slender, compressed laterally; head very distinct from neck; pterygoid teeth present; eye large, with vertically elliptic pupil.

Rostral broader than deep, scarcely visible from above; internasals about half as long as the praefrontals; frontal pentagonal, a little longer than broad, shorter than its distance from the end of the snout and than the parietals, which are short and broad; nasal entire; loreal large, square; no praeocular; 2 postoculars; temporals, $1 + 2/1 + 3$; $9/8$ upper labials, 4th, 5th and 6th (4th and 5th) entering the orbit; 1st lower labial in contact with its fellow behind the symphysial; 3 pairs of chin shields (on the right side the two posterior fused), anterior a little longer than broad.

Scales in 15 rows, vertebral moderately enlarged; ventrals, $192 + 1/2$; anal entire; subcaudals, 112 pairs.

Yellowish white above, with a dorsal series of round brown spots extending down to the sides of the ventrals, sometimes fused on the vertebral line with those of the opposite side; every interspace of the spots usually occupied by one darker blotch, which changes into a short transverse line along the middle of the body; head whitish, with four dark brown dots disposed as a cross on the fronto-parietal suture, the parietals and the parieto-occipital suture; belly whitish, speckled and laterally lineolated with brown.

Total length, 555 mm.; tail, 165 mm.

¹ G. A. Boulenger, Descript. of new Batr. and Rept. from Northwestern Ecuador, Ann. Mag. Nat. Hist., (7), IX, 1902, p. 47.

² F. Werner, Ueber neue o. seltene Rept. d. Naturhistorischen Museums in Hamburg, 1909, pp. 240-241, in Zool. Jahrbüchern, XXVIII, 1909, p. 282; Synop. der Schlangenfamilien der Amblycephaliden and Viperiden, 1921, p. 198.

Type, adult ♀, no. 1576 in the collection of the Museu Paulista, caught in Colonia Hansa, State of Santa Catharina, Brazil, in 1902, by the traveling naturalist Mr. E. Garbe, in whose honor it is named.

It is closely allied to *S. alternans* (Fischer), from which it differs in the color and markings of the head and in having no praecocular, and to *S. barbouri* Amaral, from which it differs in the markings, in the shape of the frontal and in the number of pairs of chin shields.

HETERORHACHIS gen. nov.

Hypapophyses present only in the anterior third of the vertebral column. Maxillary short, with 15 teeth decreasing in size in front and behind; mandibular teeth, 19, decreasing in size behind; pterygoids toothful, somewhat long, slightly diverging posteriorly and extending nearly up to the quadrato-mandibular articulation. Head moderate, distinct from the neck; eye large, with round pupil, slightly tending to be vertically elliptic; praecocular present; gulars absent. Body elongate, slightly compressed laterally; scales smooth, without apical pits, in a variable number of rows (15, 16, 17, 18 and 19), the vertebral row differently enlarged; some of the paraventral rows also enlarged; ventrals rounded. Tail moderate; subcaudals in two rows.

Heterorhachis poecilolepsis sp. nov.

Snout short, a little longer than the diameter of the eye. Rostral broader than deep, scarcely visible from above; internasals short, twice as broad as long, less than half as long as the praefrontals; an azygous internaso-praefrontal shield present; frontal very short, a little broader than long, as long as its distance from the end of the snout, much shorter than the parietals (4:7); nasal divided; loreal longer than deep, entering the orbit; a small praecocular between the loreal and the supraocular;

2 postoculars; temporals, 1 + 2; 6 upper labials, 3d and 4th entering the orbit, 5th and 6th very long; 3 pairs of chin shields, the middle larger. Scales smooth, without pits, and showing remarkable peculiarity as follows: 15, 16, 17, 18, or 19 rows, the vertebral sometimes only slightly and sometimes strongly enlarged transversely all along the body by the fusion of the middle row with 1, 2, 3 or 4 paramedian ones; 1, 2, 3 or sometimes 4 paraventral rows also enlarged. Ventrals, 153, rounded laterally; anal entire; subcaudals, 36/36 + n.

Type, adult ♀, no. 3002 in the collection of the Instituto de Butantan, sent alive from the locality Villa Bomfim, State of São Paulo, Brazil, on February 25, 1913, by Mr. João Rodrigues da Silva.

Total length, 450 mm. + n; tail, 65 mm. + n.

The new genus *Heterorhachis* is very interesting indeed because it shows characteristics belonging to both families *Colubridae* and *Amblycephalidae*. It agrees with the *Colubridae* in having rather long and slightly diverging pterygoids, and with the so-called *Amblycephalidae* in having hypapophyses present only anteriorly and no mental groove. It may thus suggest the suppression of the family *Amblycephalidae*,¹ the different genera of which should be included in a new subfamily of the *Colubridae*.

This subfamily, which I should call *Dipsadinae*, is perfectly characterized by pterygoid usually short (exceptionally extending to quadrate), solid teeth in both jaws, hypapophyses absent in the posterior two thirds of the vertebral column, and mental groove absent. It should include the following genera:

Dipsas Laurenti, 1768 (type, *D. indica*).²

Amblycephalus Kuhl, 1822 (type, *A. carinatus*).

Sibynomorphus Fitzinger, 1843 (type, *S. mikanii*).

Aplopeltura Duméril, 1853 (type, *A. boa*).

Pseudopareas Boulenger, 1896 (type, *P. vagus*).

Heterorhachis Amaral, 1923 (type, *H. poecilolepis*).

Through the genus *Heterorhachis*, which has rather long and slightly posteriorly divergent pterygoids, hypapophyses present

¹ See A. Günther, Rep. Brit. India, 1864, p. 324. Aiso, G. A. Boulenger, Faun. Ind., Reptiles, 1890, p. 414, and Cat. Sn., III, 1896, p. 438.

² Fitzinger (Syst. Reptilium, 1843, p. 27) selected the species *weigeli* as the type of *Dipsas*, but this was not Laurenti's conception (see Art. 30, II, 3, d, of the Int. Rules of Zool. Nomenclature).

only in the anterior third of the vertebral column, and no mental groove, the subfamily *Dipsadinae* might be connected with the *Colubridae* genera *Petalognathus* and *Tropidodipsas*, some species of which have rather long and posteriorly divergent pterygoids, hypapophyses present only anteriorly, and rudimentary mental groove or none at all.

The *Dipsadinae* species have spinous hemipenis,¹ vertically elliptic pupil or nearly so, and are arboreal, nocturnal, and snail-eaters.

***Bothrops erythromelas* sp. nov.**

Snout short, truncate and broad, with very slightly elevated canthus; eye moderate. Rostral as broad as deep; nasal divided; internasals short and broad, in contact behind the rostral; canthals short and broad, as long as the internasals; upper head scales sometimes enlarged, faintly keeled, in 5 longitudinal series between the supraoculars; subocular incompletely separated from the upper labials by one series of scales; 7 or 8 upper labials, 2d separated from the loreal pit; temporal scales keeled; 9 or 10 lower labials. Scales strongly keeled, in 21 series; keel of the scales long and low; ventrals, 144–155; anal entire; subcaudals, 33–35 pairs.

Reddish brown above with a close series of dark brown or black triangular markings alternate with or opposite to those of the other side, with an intermediate series of small, single and dark spots; head dark brown above and laterally, with some darker dots; belly yellowish, finely speckled with brown, with a series of dark spots on the sides of the ventrals extending to the first two rows of dorsal scales.

Total length, 520–540 mm.; tail, 55–65 mm.

Type, adult ♀, no. 3030 in the collection of the Instituto de Butantan. It was collected in January, near Joazeiro, State of Bahia, Brazil, and in October, 1921, was sent alive to me for determination by Professor Pirajá da Silva, director of the branch of Butantan in that State.

There are two other specimens of *B. erythromelas* in the collection of Butantan; one of them has the no. 3031, and was pro-

¹ E. R. Dunn very recently (Proc. Biol. Soc. Wash., 23, 1923, p. 188) verified that "the hemipenis of *Pseudopareas*, as determined by *P. vagus*, is undivided, the sulcus is forked. The proximal portion has small hooks, the distal portion is covered with calyces. There seems to be an ill-defined edge to the calyculate portion, so that the hemipenis is somewhat capitate."

cured through Professor Silva from the same locality as the type, in December, 1921; the other has the no. 1509, and was caught in January, 1918, near Quixadá, State of Ceará, Brazil, by Mr. Mario Trevões, travelling collector of Butantan.

Living habits: *Bothrops erythromelas* lives under clusters of 'Macambira' (*Bromelia laciniosa* Martius), near rocks, in high, sandy and arid places, and feeds on small rodents.

This species is related to *B. itapetiningae* (Boulenger, 1907), from which it is easily distinguished by its different color, lower number of dorsal scales, higher number of subcaudals, shape of the snout and other characteristics.

As far as *B. itapetiningae* is concerned, I believe that R. von Ihering¹ was not entirely correct when he stated that this species lives in the States of São Paulo and Bahia. According to the studies I have been doing on the zoögeography of the Brazilian snakes, *B. itapetiningae* is found only in a very small zone of the State of São Paulo, lying in the central and south-western part of its territory around the tropic of Capricorn and the meridian 48° W. Long., or more precisely between the meridians 47° and 49° Long. west of Greenwich and the parallels 21° and 24° S. Lat. I am taking this opportunity to correct this mistake, because it has been made many times by the authors who have followed Ihering's opinion, including F. Werner² in his recent paper on the Amblycephalidae and Viperidae.

A specimen existing in the collection of the Museu Paulista and sent from Villa Nova, Bahia, is not of *B. itapetiningae*, as Ihering considered it. It agrees with *B. erythromelas*, from which it cannot be distinguished.

***Bothrops iglesiasi* sp. nov.**

Body slender, snout obtusely pointed, with sharp canthus, eye moderate. Rostral as deep as broad; nasal divided; internasals large, in contact behind the rostral; canthals as large as or smaller than the internasals; upper

¹ R. von Ihering, As cobras do Brasil, Rev. do Muséu Paulista, VIII, 1910, p. 361.

² F. Werner, Synopsis der Schlangenfamilien der Amblycephaliden und Viperiden. Wien, August, 1921.

head scales imbricate and strongly keeled; praeoculars, 2; one subocular separated from the labials by one series of scales; upper labials, 8, exceptionally 9, 2d separated from the loreal pit, 4th much longer than the others; temporal scales keeled; lower labials, 9–13; gulars, 3–5 pairs. Scales long, lanceolate and strongly keeled, in 21–25 rows; keel of the scales long and low; ventrals, 160–170; anal entire; subcaudals, 35–43 pairs, very exceptionally undivided.

Brown above with a close series of broad, dark, transverse bands, sometimes divided in the middle and alternating with those of the opposite side; head dark, with a whitish blotch on the crown; supraoculars, internasals and canthals, whitish; belly yellowish, regularly spotted with brown.

Represented in the collection of the Instituto de Butantan, São Paulo, Brazil, by twenty specimens, the characteristics of which are as follows:

Sex and age	Upper labials	Scale rows	Ventrals	Subcaudals	Length in mm.	
					Total	Tail
♂	9/8	25	169	36/36	508	56
	8/8	25	164	35/35	625	76
	8/8	23	170	38/38	590	65
	9/8	21	166	38/38+4	490	62
	8/8	25	169	39/39	520	53
♀	8/8	21	170	39/39	452	50
	8/8	23	170	39/39	583	64
	8/8	23	163	42/42	583	70
yg. ♂	8/8	25	162	43/43	440	57
	8/8	23	166	39/39	660	80
♀	8/8	23	170	37/37	640	70
♂ (type)	8/8	23	165	40/40	495	65
yg.	8/8	23	167	43/43	290	35
♂	8/8	23	166	43/43	575	75
	8/8	23	165	37/37	620	62
yg. ♀	8/8	21	164	42/42	295	38
yg. ♀	8/8	25	169	37/37	307	34
yg.	8/8	23	160	36/36	285	32
yg.	8/8	21	158+n	41/41	235	30
	8/8	21	169	42/42	456	65
	8/8	21	166+2/2	41/41+n	485	63

All the specimens were collected in 1918 by the excellent travelling naturalist of Butantan, Dr. Fr. Assis Iglesias, in the interior of the State of Piauhý, Brazil, near Fazenda Grande on the right bank of the Gurgueia River, where they seem to be abundant.

Bothrops iglesiasi is closely allied to *B. neuwiedii* Wagler which also has been found in the interior of the State of Piauhý by Dr. Iglesias. It can be distinguished from *B. neuwiedii* by the following characteristics.

	<i>B. iglesiasi</i>	<i>B. neuwiedii</i>
Ventrals	160-170	166-187
Subcaudals	35-43	40-53
Upper labials	4th longest	3d and 4th longest
Series of scales between the subocular and the labials	1	2 or 3
Color and markings	Brown above, with a close series of broad dark transverse bands	Dark yellowish olive or pinkish brown above, with a single or double alter- nating series of large black light-edged spots and a lateral series of small and round black light-edged spots

Living habits: This species, which is named in honor of Dr. Iglesias, lives in rocky places and feeds on lizards.

Bothrops pirajai sp. nov.

Body and head broad and short; eye small; snout obtusely pointed, with strong and slightly elevated canthus. Rostral as deep as broad; internasals very small, in contact behind the rostral; canthals twice as large as the internasals; supraoculars relatively narrow, twice as long as broad, separated one from the other by 7 series of scales; upper head scales small and keeled; 2 praecoculars; 2 postoculars; 2/1 suboculars, separated from the upper labials by one series of scales; 8 upper labials, 2d forming the

anterior border of the loreal pit; 10/10 lower labials, 1st pair separating the symphysial from the only pair of chin shields; 3 pairs of gulars. Scales very short, with round tip and with long and very high keel, in 27 rows; ventrals, 164; anal entire; subcaudals, 31 pairs + n.

Brownish yellow above with 15 black Λ -shaped markings on each side, separated by broad interspaces where small black spots are sometimes present; tail entirely black above; head grayish black without markings; belly yellowish, profusely speckled with brownish black, with black spots on the sides of the ventrals.

Total length, 1130 mm.; tail, 100 mm.

Type, adult ♀, no. 3008 in the collection of the Instituto de Butantan, São Paulo, Brazil. It was collected in Ilheos, Bahia, Brazil, and is dedicated to Professor Pirajá da Silva, director of the branch the Instituto de Butantan has in Bahia. Professor P. da Silva sent it alive to me for determination, among other specimens of snakes, in December, 1921.

Bothrops pirajai is very different from all the other Brazilian species of *Bothrops*, which have the 2d upper labial in contact with the loreal pit. Its most closely allied species is *B. jararacussu* Lacerda, 1884, from which, however, it easily can be distinguished by the following characteristics.

	<i>B. pirajai</i>	<i>B. jararacussu</i>
Internasals and canthals	Small.	Very large.
Ventrals	164.	170-185.
Postocular streak	Absent.	Present.
Dorsal markings	Black Λ -shaped markings separated by broad interspaces.	Yellow forked markings issuing transversally from the ventrals.

Bothrops neglecta sp. nov.

Snout obtusely pointed, with canthus sharp and slightly elevated; eye moderate. Rostral a little deeper than broad, nasal divided; internasals small, in contact behind the rostral; canthals longer and broader than the internasals, twice as long as broad; upper head scales small, imbricate, faintly keeled, in 5 series between the supraoculars, which are large, smooth, longer than broad; 2 praeoculars, upper longer and deeper than lower; 2 postoculars; 1 subocular, separated from the upper labials by one or two

series of scales; 8 upper labials, 2d forming the anterior border of the loreal pit, 8th very low; 11 or 12 lower labials; symphysial separated from the only pair of chin shields by the first pair of lower labials. Scales in 25 rows, strongly keeled, the keels lower and longer than those of *B. atrox* (L.); ventrals, 164; anal entire; subcaudals, 52 pairs.

Yellowish gray above with brownish black quadrangular markings alternate, or sometimes connected, with those of the opposite side, and having an intermediate series of single, small, round and dark spots; another series of double, larger, round and dark spots is present between the quadrangular markings and the side of the ventrals; no marking on the head and no streak from the eye to the angle of the mouth; belly yellowish, slightly speckled with brown in the middle and blotched with black on the sides.

Total length, 772 mm.; tail, 100 mm.

Type, adult ♂, in very good condition, no. 3010 in the collection of the Instituto de Butantan, São Paulo, Brazil, collected in Bahia, Brazil, and sent in September, 1921, by Professor Pirajá da Silva, director of the branch of Butantan in that State.

The British Museum has a specimen which practically agrees in every point with the type of *B. neglecta*, though Boulenger¹ has identified it with *B. atrox*. It is the specimen λ of Boulenger's Catalogue. It was sent to the British Museum by the Demerara Museum, and is said to have been collected in British Guiana, which is probably not so. It has Sc. 24, V. 159, C. 47 p., instead of Sc. 25, V. 161, C. 47 p., as Boulenger had found.

If we consider carefully all the other specimens identified with *B. atrox* in Boulenger's Catalogue, we find that they have V. 176–216, C. 58–77, and so we may observe that Boulenger's specimen does not fall within these limits. It does not seem, either, to be a dwarf specimen of *B. atrox*, because not only is it shorter than *B. atrox*, but its scale keels, number of upper labials, size of ventrals (which are well grown) and the disposition of markings also are different from those of this species.

Moreover, since 1920 I have been engaged in a very meticulous revisionary study of *B. atrox* and its most closely allied species, the results of which will be published in the near future.

¹ G. A. Boulenger, Cat. Snakes, 1896, III, p. 539.

I started this study in Brazil, where I examined practically all the collections of snakes, and am continuing it at the Museum of Comparative Zoölogy with coöperation from Dr. Thomas Barbour who kindly facilitated me with access to the collections of this Museum. I also have examined the material in the United States National Museum and in the American Museum of Natural History through the courtesy of Dr. L. Stejneger and G. K. Noble and Mr. A. I. Ortenburger.

Having thus so far examined a great number of specimens of *B. atrox* from Mexico, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, French Guiana, Trinidad, Tobago, St. Lucia, Martinique, Ecuador, Peru, Brazil and Paraguay, I am able to state that its most important characteristics in scutellation are as follows: Sc. 23–33, V. 190–231, C. 56–75, Up. lab. 7/7 in about 90 % of the specimens. I can conclude, therefore, that the type specimen I describe here and its paratype in the British Museum are really different from *B. atrox*.

***Bothrops leptura* sp. nov.**

Snout obtusely acuminate, turned up a little at the end, with very slightly raised canthus; eye moderate; rostral narrow, a little deeper than broad; nasal divided; internasals small, separated one from the other by one scale; canthals a little longer than broad, longer than the internasals; supraoculars striated, twice as long as broad; upper head scales rugose, in 7 longitudinal series between the supraoculars; 2 praoculars, the superior twice as long as deep, reaching the canthus; 3 postoculars; 1 or 2 suboculars, separated from the upper labials by one series of scales; 7 upper labials, second forming the anterior border of the loreal pit; temporal scales keeled. Scales strongly keeled, with rounded tip, in 27 rows; keels long and very low. Ventrals, 202; anal entire; subcaudals, 82 pairs. Tail prehensile, very thin and long.

Greenish gray above with dark light-edged spots disposed vertically and in pairs, separated, or sometimes confluent with those of the other side; a series of round dark spots on each side above the ventrals, which are yellow, very lightly powdered with darker; head with two dark, light-edged, longitudinal streaks divergent behind the supraoculars, convergent on the occiput and again divergent on the nape; a dark, light-edged band from

the eye to the angle of the mouth; labials yellowish gray; upper surface of the tail, anteriorly, gray without marking, and posteriorly, yellow and unspotted, lower surface entirely yellow.

Total length, 447 mm.; tail, 75 mm.

Type, no. 50,110 in the collection of the United States National Museum, from Cana, eastern Panama, 3000 ft. altitude, collected on June 27, 1912, by Mr. E. A. Goldman of the U. S. Biological Survey.

Bothrops leptura, which easily can be distinguished from all the other species by its prehensile, very long, thin and spotless tail, and by its characteristic color, was included in a collection of *Bothrops* which was kindly sent me for study by Dr. L. Stejneger through Dr. Thomas Barbour.

***Bothrops andiana* sp. nov.**

Snout broad, rounded, with canthus sharp and not elevated; eye large; rostral flattened, rectangular, a little deeper than broad; nasal divided; internasals large, flat, disposed almost transversely, in contact one with the other; canthals also flat, but smaller than the internasals; supraoculars smooth, rounded and separated one from the other by 3 to 6 series of scales, the medial one or more series sometimes very large; upper head scales smooth on the snout; 3 praeoculars, the upper one much larger than the others, twice as long as deep; 2 postoculars and a subocular, separated from the upper labials by only one series of scales, or sometimes in contact with them; temporal scales faintly keeled; 7 upper labials, 2d forming the anterior border of the loreal pit, the last 5 of the same size; 9 or 10 lower labials, first pair separating the symphysial from the only pair of chin shields. Scales in 21 rows, short, strongly keeled, with rounded tip, keels long and somewhat high; ventrals, 157-161; anal entire; subcaudals, 50-55 pairs. Tail short, non-prehensile.

Olive gray above, with dark light-edged triangles, with their apices sometimes meeting, on the back, with those of the opposite side; a dark light-edged streak from the eye to behind the angle of the mouth; upper labials and lower surface of the head bright yellow; belly yellow, closely powdered with dark gray, showing sometimes a medial yellow streak anteriorly.

Total length, 605 mm.; tail, 90 mm.

Type, adult ♂, no. 8832 in the collection of the Museum of Comparative Zoölogy, caught in 1912, in Machu Picchu, Department of Cuzco, Peru,

about 9000–10,000 ft. altitude, by Mr. G. F. Eaton (Yale Peruvian Expedition).

This Museum has two more specimens of *B. andiana*: one of them, no. 8833, adult ♂ (total length, 503 mm.; tail 69 mm.), was collected at the same time and in the same place as no. 8832; the other, no. 12,415 (total length, 464 mm.; tail, 58 mm.), was collected on October 30, 1915, in Machu Picchu, Cosireni River, by Mr. Edmund Heller (Yale and National Geographic Soc. Expedition), and was received from the U. S. National Museum (no. 60,715).

No. 12,415 had been identified with *B. picta* (Tschudi)¹ by Thomas Barbour and G. K. Noble,² who considered it a local race of *B. lanceolata* (Lacép.). But *B. andiana* differs from *B. picta* by the shape of the snout, and of the rostral, the number of upper labials, and of series of scales between the subocular and the upper labials, the color and the markings. It rather agrees with *B. pulcher* (Peters),³ from which it can be distinguished, however, by its lower number of ventrals,⁴ different system of markings and shape of the dorsal scales, of the snout, and of the rostral shield.

It is different from *B. microphthalmia* Cope,⁵ because of the shape of the snout and rostral, 2d upper labial in connection with the anterior border of the lorulus, number of scale rows, size of the eye, and keel of the dorsal scales.

It is also different from *Bothrops pleuroxantha* (Blgr.)⁶ because of the lower number of scale rows, higher number of ventrals, 2d upper labial in connection with the lorulus and other

¹ J. J. v. Tschudi, Fauna Peruviana, Herpet., 1845, p. 61, pl. 10.

² Thomas Barbour and G. K. Noble, Proceedings of the U. S. National Museum, 1921, Vol. 58, p. 620.

³ W. Peters, Monatschrift berlin. Akademie, 1862, p. 672.

⁴ Two female specimens existing in the British Museum Collection, and identified with *B. pulcher* by G. A. Boulenger in Vol. III, p. 539, of his 'Catalogue of Snakes' (1896), seem to be different from this species, because they have a higher number of scale rows (23 instead of 21) and a lower number of ventrals (156–158, instead of 172, in spite of being females).

⁵ E. D. Cope, Journ. Acad. Nat. Sci. Phila., 1876, Vol. 8, (2), p. 182.

⁶ G. A. Boulenger, Ann. Mag. Nat. Hist., (8), X, 1912, p. 423.

characteristics. It differs from *B. peruviana* (Blgr.)¹ because of the non-prehensile tail, lower number of scale rows and ventrals, and snout and rostral shape. Nos. 8832 and 8833 had been identified with *B. lanceolata* (Lacép.) by Thomas Barbour² in 1913. But it can be easily separated from *B. atrox* (L.)³ (of which *B. lanceolata* (Lacép.)⁴ is a strict synonym according to my opinion), which occurs too in Peru, whence the U. S. National Museum has a specimen, collected at Rio Cosireni by E. Heller. The number of ventrals of *atrox* ranges from 190 to 231 or more; the scale rows from 23 to 33; and the scales have short and very high keels.

¹ G. A. Boulenger, Ann. Mag. Nat. Hist., (7), VII, 1903, p. 354.

² Thomas Barbour, Reptiles collected by the Yale Peruvian Expedition of 1912. Proc. Acad. Nat. Sci. Phila., Sept., 1913, p. 507.

³ Linné, Systema naturae, 10th ed., 1858, T. 1, p. 222, no. 263.

⁴ Lacépède, Serpents, 1789, Vol. 2, pp. 80, 121, pl. V, fig. 1.